to my mind undoubtedly entitled to specific distinction, which more recent observers have accorded it.

TRIVIA EOS, n. sp. Plate 7, figs. 10, 11.

Shell globosely ovate with rounded base, white, rather finely ribbed. Dorsal line indicated by a narrow smooth area from which ribs diverge in every direction, a few being interposed on both sides; posteriorly they pass directly over the spire, which projects well, showing five whorls. On the ventral side the spiral ribs have an oblique trend and extend well into the aperture, where they decrease in number and become coarser. The aperture is rather narrow, but slightly wider anteriorly, outer lip thickened outside, strongly ribbed transversely, with about 29 ridges forming teeth on the inner margin; retracted anteriorly. The inner lip bears a very small callous projection above, and near the base there is a rounded ridged lobe projecting inward.

Length 25.7, diam. 20, alt. 17 mm.

Habitat, Boshu, Japan (Hirase).

This magnificent *Trivia* is named for the "Sunrise Kingdom." Type in the collection of Mr. Hirase. In size it is approached only by *T. oniscus* Lam. of South Africa, which however differs by its pink color, larger smooth dorsal area, fewer ribs, shorter spire, and especially by its much wider aperture, as in other members of the South African group of Trivias, to which *T. eos* has but little affinity. It should be noted that the irregularity on the left side of fig. 10 is wholly an effect of light in the photograph, as that slope of the shell is perfect and evenly curved.

A COLLECTOR IN WESTERN CUBA AND THE ISLE OF PINES.

BY REV. H. E. WHEELER.

A mid-winter vacation is of such rare occurrence in a minister's career that the generosity of a congregation that made such a thing possible deserves special mention. It was my purpose to join my genial correspondent, Mr. Walter F. Webb, at Baracoa on the North Coast of Cuba, for which port he sailed early last January, but it turned out that we were separated by the length of the island, and my excursion to the Oriente Province was abandoned. Enroute

for Havana I had the unexpected good-fortune to be on the first regular train which passed over the sea-going extention of the Florida East Coast Railway, completing the line from Knight's Key to Key West.

Shortly after my arrival in Havana, I met Dr. Carlos de la Torre, Curator of the Zoological Department in the Academy of Sciences, Havana, and Professor of Biology and Zoology in the University of Havana, and before I could protest I found myself in the toils of characteristic Cuban hospitality. The Doctor's contributions to the literature of Cuban malacology are too well known to readers of the NAUTILUS to need any reference here, but it may not be so well known that he was the favorite pupil of Felipe Poey, the most brilliant naturalist which Cuba has produced.

To see his collection is worth the expense of a trip to the Antilles. So far as the described Cuban fauna is concerned it is almost complete. Here are specimens of nearly every species, and for the display of a variable shell like *Polymita picta*, Born, or *Coryda alauda*, Fer., many ample drawers are required. You may see specimens of *Licina percrassa* (Wright) Pfr., rarest of Cuban mollusks, and of which no living examples have ever been found. Its habitat is Luis Lazo, Pinar del Rio Province, in one of the highest peaks of the Sierra de Los Organos.

In fact a drawer of Cuban shells calls up many a vivid scene and many an honored name among the students of molluscan life. Poey and Gundlach and Pfeiffer seem to spring out of the past, speaking with such versatility that you give them respectful audience; in your imagination Wright and Arango are on the trail of a hundred new species which unaccountably have been overlooked; the Count Morelet is on the high seas again exploring regions that no naturalist ever saw before him; and Férussac is rampant with chagrin that some oft-handled snail is crawling about with a name wholly unworthy of its race.

Once on Cuban soil, under the spell of matchless evening skies, the dormant or overworked energies aroused by all that a tropical winter can be, why should one sleep? A single rainy day at Ceiba Mocha, at Rangel, or on any limestone mountain-side, and how shall arid plains or denuded hillsides, where only shells of somber hue and homely feature care to dwell, claim any longer a collector's enthusiasm? For here is *life* and color and health, not only in the

lowly kingdom of crawling things, but for the student also who searches out their haunts.

It was quite natural that the first shells collected by the writer should have been those introduced by commerce, namely, *Rumina decollata*, Linn., and *Subulina octona*, Brug., but surely I must have seemed, both to natives and tourists, more like an escape from some asylum than a would-be naturalist, engaged, as I was, in turning over unceremoniously the flower-stands in the Parque de Colon, right in the heart of Havana.

It was 1878 that Arango published a catalogue[1] of Cuban shells which included also those from the Isle of Pines. In it 578 land forms alone are enumerated, but since that list was prepared more than a hundred species and sub-species have been described. But this is only a numerical evidence of the richness of the fauna.

Arango's collection is at the Academy of Sciences, and Gundlach's "Museum" may be seen at the Institute. His (Gundlach's) observations were published only after the most painstaking study; birds, reptiles, insects, and shells all claiming his interest. With a conscience for accuracy which is the naturalist's only passport in the scientific world, he would delay the taxidermy of a mammal or bird until he understood its anatomy and had become thoroughly familiar with its habits.

Though I have hardly a bowing acquaintance with ornithology, there were some birds which interested me. Among them was a Phæthon,[2] the nearly extinct "guacamayo" (*Ara tricolor*), and the "carpintero real" (*Picus bairdi*). The stately flamingo (*Phœnicopterus ruber* Linn.) is common enough, I suppose, but of irresistible plumage.

I was attracted by a turtle (*Emys rugosa*), which I saw in great numbers near Camoa, and my attention was called to a curious fresh-water fish[3] which has survived the evolutional changes of nobody knows how many thousand years. Here also could be

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[1] "La Fauna Malacologica Cubana, par Rafæl Arango y Molina," Havana, 1878.

[2] *Phæthon flavirostris* Brandt, the only representative of the *Phæthontidæ* which visits our Eastern seaboard.

[3] *Lepistosteus* (*Atractosteus*) *tristœchus*, Block, a species still living in Mexico and the Southern United States.

studied that rare insectivorous mammal, which from its channeled teeth, is called *Solenodon* (*S. cabanus* Peters). There is a related species[1] in Santo Domingo, but nowhere else, I believe, except in Madagascar, is there an animal, the *Centetes*, at all like it. The Hutia, a large rodent, which in war times was hunted for food, is represented by three species,[2] but one of these, as well as the *Solenodon*, belongs to the fauna of Eastern Cuba.

At the University of Havana nothing is more touching than the regard in which Felipe Poey is held. His statue, a magnificent work of art, is the chief memorial in the quadrangle, and his library with many interesting relics, and many of his types have their repository in the spacious Museum. The present University, by the way, represents only one of the many far-seeing services rendered the Cuban people, during the American intervention, by Gen. Leonard Wood. He converted the old ordnance factories into University buildings which now fittingly crown the Vedado.

At the time of my visit the Professor's assistants were mounting a recently captured ray (*Lebisa*), a fish well known by name only to Poey and mentioned in his several works, but which has never been described.[3] This curious inhabitant of the Caribbean Sea is from one to two meters in diameter, having a rough spiny skin which has been used by the natives as a dish rag. It has a long, slender, sharply-pointed tail, near the base of which are erected two obliquely-set and forbidding spines, which look much like the stoutly grown thorns of a healthy locust tree.

For one who is interested in botany the notes of A. Richards in Ramon de la Sagra's "*Historia Fisica Politica y Natural de Cuba*," will be found instructive, and other works, such as the "*Flora Cubana*," of Sauvalle, the "*Flora Havanensis*," of Gomez de la Maza, and the "*Flora of the British West Indian Islands*," of Grisebach, have an honorable place among the older authorities.[4]

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[1] *Solenodon paradoxus* Brandt.

[2] *Capromys fournieri*, Desmarest; *C. prehensilis*, Poeppig; and *C. melanurus*, Poey.

[3] The description will appear in Poey's "*Ictiologia Cubana*," which Dr. de la Torre is now editing for publication.

[4] This painstaking catalogue has the advantage of being written in English. Its author, A. H. R. Grisebach, M. D., was Professor of Botany in the University of Göttingen, and the first edition was published in London in 1864.

Of characteristic trees one should mention the gigantic *Ceiba*,[1] the "West-Indian God-tree," with its strangely distorted and buttressed trunks; the *Almacigo*,[2] whose maroon-red bark peels off much after the fashion of our sycamore; and a heavy-foliaged evergreen, the Indian laurel[3] everywhere abundant. The deep holes which often corrugate the trunk of the last-named species are favorite retreats for *Liguus fasciatus*, Müll., and the common *Eurycampta bonplandi*, Lam. On the Güines road near Camoa, I took sixteen specimens of this noble shell from the "crevices" of a single tree.

At Matanzas I saw the *Salvadera*,[4] a rather large tree whose fruit, when fully ripe, discharges its wedge-shaped seed from a large spherical pod with a violent explosion. When such a catastrophe overtook one of my specimens in my room at the hotel, I am not sure but that the other guests had good cause to suspect a suicidal termination of an unclassified American.

On my trip to Camoa I collected a shrub, the leaflets of which strongly reminded me of our native holly. That evening my Cuban host, seeing what I had in my bag, held up his hands in horror, crying, "*Guao! Guao!*," and immediately calling some tongs into requisition, unceremoniously disposed of my beautiful plants. I had collected one of the most poisonous plants[5] on the Island. A terrible pain and swelling usually attends infection, often fever, and some natures are so sensitive to it that they cannot pass under its shade without being poisoned. But though it was prophesied that I would pay dearly the penalty of my ignorance, no appreciable inconvenience was suffered. Being already immune to its relative, our common poison-oak,[6] I am tempted to experiment next with that unnamed plant which Professor Simpson so utterly abhorred.[7]

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[1] *Ceiba pentandra* Gaertn. —*Eriodendron anfractuosum D. C.*

[2] *Bursera gummifera* L., of the older authorities, now called *Elaphrium simaruba* (L.). This tree is common in Florida, there being known as the "*gumbo-limbo.*" [3] *Ficus nitida* L.

[4] *Hura crepitans* L., of the family *Euphorbiaceæ*, called in English-speaking countries "*sand-box.*"

[5] *Comocladia platyphylla.* Another member of this genus which occurs in the Western provinces of Cuba is *C. dentata.* The (*Hippomane mancinella* L.), however, is a much more dangerous plant, and immunity from one class of poisons does not justify such a prospect in respect to others.

[6] *Rhus radicans* Linn. [7] See "Collector's Journal," Vol. I, No. 4, in loco.

Ceiba Moche, a little village of thatched cabins near Matanzas, is a famous place for shells. Though the season was unusually dry, I collected the following species there in a few hours:

Oleacina oleacea, Fér.
Oleacina solidula, Pfr.
Thysanophora vortex, Pfr.
Cysticopsis debilis, Pfr.
Cysticopsis cubensis, Pfr.
Helix (Microphysa) stigmatica, Pfr.
Jeanneretia multistriata, Desh.
Eurycampta bonplandi, Lam.
Thelidomus auricoma, Fér.
Liguus fasciatus, Müll.

Urocoptis scaeva, Gund. One of the two sinistral representatives of this genus found in Cuba, the other being Urocoptis coronadoi, Ar., from Marianao, near Havana.

Urocoptis fortis, Gund.
Urocoptis gracillima, Poey.

Urocoptis philippiana, Pfr. This beautiful species has not been previously reported from this locality. It had chosen a piece of wall unoccupied by other Urocoptids, and seemed to have developed a prosperous colony.

Megalomastoma apertum, Poey.
Ctenopoma rugulosum, Pfr.
Chondropoma dentatum, Say.

Chondropoma pictum, Pfr. This species is distinct from *pfeifferianum*, Poey. The animal differs by having red tentacles, and in the shell the peristome is simple. The sexes are separate, the male being always about one-third smaller than the female. On the female shell is generally to be seen a white mark caused by the abrasive contact of the male.

Eutrochatella sloanei, Orb.
Helicina adspersa, Pfr.
Alcadia hispida, Pfr.
Emoda submarginata, Gray.
Alcadia nitida, Pfr.

The *Jeanneretia multistriata* calls to mind a bit of history. Ch. Jeanneret was a Swiss watch-maker who, in 1868, was living at Santiago de Cuba. He discovered many important species, and was a valued correspondent both of Gundlach and Poey. But being taken for a spy during one of the political uprisings he was shot from across the river. His collection was lost. The subgenus *Jeanneretia*, erected by Pfeiffer in his honor, is a genuine Cuban group, and is remarkable for its spiral ridges. Its most typical representative is *Jenneretia sagraiana*, named by A. d'Orbigny in honor of Don Ramon de la Sagra, the author of the famous "*Historia fisica, politica y natural de la Isla de Cuba*," 10 volumes, Paris, 1840–1850.

Another species which bears the name of an almost forgotten naturalist is *Helix parraiana*, Orb. D. Antonio Parra was a native of Spain, and has the distinction of having written the first work on Cuban fishes. This was published in 1787, the engravings being made on wood by his son. His expedition was furnished by the Museum of Madrid, but his work on the fishes and crustaceans was printed in Cuba.

The Loma de Camoa[1] is a locality which has been thoroughly explored, but as it can be reached in an hour from Havana on the electric railway, it is impossible to pass it by. Here I collected the following species:

Oleacina oleacea, Fér. Polygyra paludosa, Pfr.
Oleacina solidula, Pfr. Helix (Microphysa?) stigmatica, Pfr.
Oleacina subulata, Pfr. Cysticopsis cubensis, Pfr.
Thysanophora vortex, Pfr. Jeanneretia multistriata, Desh.
Thelidomus auricoma, Fér. Eurycampta bonplandi, Lam.

Liguus fasciatus, Müll. At Cardenas this species is white, generally devoid of all markings, save occasionally a few green lines on the last whorl. But at Matanzas—less than twenty-five miles to the west—it is richly adorned, and like Joseph's coat, with many colors, and the apex is almost invariably a rosy hue.

Urocoptis humboltiana, Pfr. Urocoptis cyclostoma, Pfr.

Urocoptis ischna, Pils. I am convinced that ischna is only a form of cyclostoma. The smooth form is generally found in the stone walls at the base of the hill, and on either side of the provincial road, but with it is a costate form that links it with the ribbed variety. This (ischna) is usually collected on the exposed cliff above where the heat of the sun would supposedly develop such a protective sculpture, and a series of specimens can be laid down showing the imperceptible transition from the typical and original form down to the elaborately ribbed variety.

Succinea sagra, Orb. Eutrochatella sloanei, Orb.
Cistula catenata, Mke. Eutrochatella babei, Arango.
Chondropoma dentatum, Say. Helicina adspersa, Pfr.
Chondropoma pfeifferianum, Poey. Alcadia nitida, Pfr.
Proserpina depressa, Orb., a species without operculum.

[1] *Loma* = hill; otherwise known as "Jamaica," and for that reason a frequent occasion for confusion of localities.

The following species are also known from this locality:

Hyalinia gundlachi, Pfr. Macroceramus unicarinatus, Lam.

Microceramus turricula, var. perconicus, Pils.

Melaniella acuticostata, Orb. Urocoptis camoensis, Pfr. and

Vertigo pellucida, Pfr., which I found abundantly at Mariano. In a small "laguna" near Camoa I found *Ampullaria conica*, Wood, a *Planorbis*, *Ancylus havanensis*, Pfr., and *Physa cubensis*, Pfr.

At Guanabacoa in the Havana Province there is a vigorous colony of *Carocolus sagemon*, var. *semiaperta*, Mart., which has a curious history. The species belongs to Eastern Cuba. Some fifty years ago Dr. Nicolás Gutierrez, the founder of the Academy, and one of Cuba's most distinguished scientists, put some young *sagemons* in his garden at S. Francisco de Paula, near Guanabacoa. They were typical *Caracolus arangiana* in different colors, some with and some without umbilicus. But all are now umbilicated, and correspond precisely with the variety named by Martens, *semiaperta* (not in Arango), which came originally from the Cauto river near Bayamo.[1]

Cardenas and Matanzas are well worth a visit whether one has visions of snails or not. The former city—the fifth in size on the Island[2]—is 106 miles from Havana by rail, and its commerce in honey, mahogany and asphalt has been augmented greatly by American enterprise. Indeed Cardenas has been called an American city, though I saw fewer Americans and heard less English there than in other western ports. However, the whole city turned out on Sunday to witness the increasingly popular American game—baseball.

I heard a missionary, whose church joined hard against a blacksmith shop, patiently compete for a hearing with its busy anvil, and just across the narrow street rang deafeningly and incessantly the electric gong of a moving picture show, which form of amusement has become as fully identified with Cuban life as it has outrun our American taste for cheap entertainment. The beautiful Bay is very ample but shallow, and lies over extensive beds of asphalt. The water is almost fresh from the constant upward flow of some mighty subterranean river, or perhaps from many streams flowing through the limestone rock of this region.

Here I found flourishing churches, well disciplined schools, and

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[1] Prof. Pilsbry considers *semiaperta* only a variety of *arangiana*.

[2] Its population is about 25,000.

an extensive Museum, whose director, Sr. Francisco Blanes, is an ardent conchologist as well as a devout Christian. In fact, the Museum owes many of its choicest collections to this generosity, and in token of their appreciation the Trustees have given him a life pension and made him honorary curator.

In the court of the new Museum building *Bulimulus sepulchralis*, Poey and *Ennea bicolor*, Hutt., the latter introduced within the past decade, had found a congenial home.

At Matanzas I was the recipient of many courtesies. Dr. Luis A. Cuni, Professor of Natural Sciences in the Instituto de Matanzas, gave me an automobile excursion through the beautiful Yumuri Valley, which lies under the protecting care of the Palenque de Matanzas, and its twin "loaf" the Pan de Matanzas.[1] We ascended the San Juan river in a trim launch getting a magnificent view of the verdant meadows and the palm-crested mountains. At the Bellamar caves our guide was an old Cuban who claimed to be their discoverer fifty years ago, and who seemed to be veritably a part of their grotesque formations. With Dr. Valdez graciously serving as interpreter, Dr. Cuni and I compared notes on Natural History, and parted the best of friends.

To the west of the city rises the Loma de Simpson. On its summit is a hermitage—the Ermita de Montserrate—which preserves a cherished memorial of Spanish ecclesiastical history. In this revered situation I collected two interesting *Urocoptids*—*U. poeyana*, Orb., and *U. elegans*, var. *auberiana*, Orb.,—and many beautiful *Liguus* from the thorny hedges of the *Euphorbia*.[2] I reached the crest of the hill in the early morning, and I shall not soon forget the panorama of La Cumbre, the mountains set against the deepest of blue skies, the Valle de Yumuri, a mighty garden of Royal Palms and tropical flowers, nor the beautiful city itself, whose buildings in dazzling white seemed to step down to the bay with stately tread. The Bay of Matanzas is an æsthetic challenge; not until you see for yourself, my gentle reader, will you believe that it has mastered the science of color and perfected the art of display.

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[1] Both of these mountains are famous for their shells. Nothing is more attractive in the cabinet than a well selected series of *Chondropoma presasianum*, Gundl., and *Chondropoma irradians*, Shutt., which can be collected on both "pans."

[2] *Euphorbia lactea*, Han.

The Matanzas fauna was studied and described by Pfeiffer. Dr. L. Pfeiffer came to Cuba from Germany with Dr. Juan Gundlach, the ornithologist, and Edward Otto, the botanist, in 1839. Pfeiffer and Otto left after a residence of two months, but Gundlach remained, and for more than fifty years he devoted his talents to the exploration of Cuba's Natural History, becoming a worthy co-laborer of Poey.

(*To be concluded.*)

NOTES.

Dr. Pilsbry will sail from San Francisco Jan. 7th, for the Hawaiian Islands, where he will spend several months in studying *Achatinellidæ* for the Manual of Conchology. Articles and notes for publication in THE NAUTILUS should be sent, up to April 1st, to Mr. Johnson.

FEEDING HABITS OF ARIOLIMAX.—Dr. C. Hart Merriam who has been summering in the redwood forest of Marin County California sends some interesting notes about the feeding habits of *Ariolimax columbianus*. He observed it taking the fallen drupes of the California laurel (*Umbellularia*) which have a tough skin covering a layer of pulp outside of a hard kernel. The snail took the fruit by the end which had been attached to the stem and was able, by protruding the buccal mass, to eat out the pulp between skin and kernel for about half the surface of the fruit without breaking the rind. Subsequently it was observed to gnaw off the base of a toadstool about 3 inches in height with a stem a quarter of an inch in diameter, and make a meal of the stem. It is probable notwithstanding its "carnivorous" dentition that these slugs live chiefly on such vegetable matter. W. H. DALL.

MUSSELS IN A WATER MAIN.—The London Metropolitan Water Board officials have just made an extraordinary discovery. Recently it was found that a 36-in. water main at Hampton-on-Thames was showing signs of becoming choked. It was opened, and 90 tons of fresh-water mussels were taken out of a quarter of a mile of the main. The mussels were so tightly massed that the bore was reduced from 36 in. to 9 in.—*Popular Mechanics*, Nov. 1912.